

# RESOURCES FOR THE FUTURE/1983 NATIONAL WATER BENEFITS STUDY QUESTIONNAIRE

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LOCATION #: \_\_\_\_\_  
LINE #: \_\_\_\_\_

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FORM A

## WATER BENEFITS SURVEY

INTERVIEWER: \_\_\_\_\_ TIME ENDED: \_\_\_\_\_  
INTERVIEWER ID. #: \_\_\_\_\_ TIME STARTED: \_\_\_\_\_  
DATE: \_\_\_\_\_ INTERVIEW LENGTH: \_\_\_\_\_ (MINUTES)

Hello, I'm \_\_\_\_\_ of Opinion Research Corporation in Princeton, New Jersey. We are talking to a cross-section of people in the United States about how much public programs are worth to them. Your views will be used to help policy makers make informed decisions.

First, let me begin by saying that most of the questions have to do with your attitudes and opinions, and these are no right or wrong answers.

This interview is completely confidential; your name will never be associated with your answers.

- First, I'm going to read a list of several issues which, over the years, have been of concern to taxpayers. For each, please tell me whether you feel the amount of money we are spending as a nation is too much, just about the right amount, or too little.

	Too Much	About the Right Amount	Too little	DON'T KNOW	REFUSED
a. Reducing air pollution	1	2	3	4	5
b. Fighting crime	1	2	3	4	5
c. Reducing water pollution in freshwater lakes, streams, and rivers	1	2	3	4	5
	ASK Q. 2	ASK Q. 4	ASK Q. 3	ASK Q. 4	

IF Q. 1c IS "TOO MUCH", ASK:

- You said that we are spending "too much money" on reducing water pollution in freshwater lakes, streams, and rivers. In your opinion, do you think we should be spending a great deal less or only a little less on reducing water pollution?

- Great deal less
- A little less
- DON'T KNOW
- REFUSED

→ SKIP TO Q. 4

IF Q. 1c IS "TOO LITTLE", ASK:

- You said that we are spending "too little money" on reducing water pollution in freshwater lakes, streams, and rivers. In your opinion, do you think we should be spending a great deal more or only a little more on reducing water pollution?

- Great deal more
- A little more
- DON'T KNOW
- REFUSED

### ASKEVERYONE

(HANDRESPONDENTBOOKLET)

- I'd like you to look at this booklet that contains several cards. Please look at Card 1. It contains three statements regarding pollution control and costs of pollution control. Please follow along as I read these statements to you, and then tell me which statement you agree with most. (READ EACH STATEMENT TO RESPONDENT.)

- Protecting the environment is so important that pollution control requirements and statements cannot be too strict and continuing improvement must be made regardless of cost, or
- We have made enough progress on cleaning up the environment that we should now concentrate on holding down costs rather than requiring stricter controls, or
- Pollution control requirements and standards have gone too far and they already cost more than they are worth.
- BETWEEN 1 AND 2 (VOLUNTEERED)
- DON'T KNOW
- REFUSED

APPENDIX A

5. Some national goals are more important to people than others. How important to you personally is a national goal of protecting nature and controlling pollution? Is it very important, somewhat important, or not very important to you?

- 1 VERY IMPORTANT  
2 SOMEWHAT IMPORTANT  
3 NOT VERY IMPORTANT  
4 DON'T KNOW

If "1" ON Q.5 ASK:

You said a national goal of protecting nature and controlling pollution is "very important" to you. Would you say it is one of your very top priorities or is it of somewhat less importance to you?

- 1 VERY TOP PRIORITY  
2 SOMEWHAT LESSER IMPORTANCE  
3 DON'T KNOW

1. Please turn to Card 2. It contains a list of six different sources of water pollution in freshwater lakes, rivers and streams. Tell me which one or two sources you feel probably cause the most water pollution in the nation. Just read me the numbers.

- 1 Runoff from agriculture
- 2 Sewage from cities and towns
- 3 Drainage from mines
- 4 Runoff from roads and highways
- 5 Seepage from garbage dumps
- 6 Dumping of factory waste into waterbodies
- 7 NONE
- 8 DON'T KNOW
- 9 REFUSED

#### SECTION B: HOUSEHOLD ACTIVITIES GRID

INTRODUCTION: The next few questions concern participation in outdoor recreational activities by members of this household.

8. First, how many people -- both adults and children -- live in this household, including yourself?

01 Respondent only → SKIP TO Q.10  
98 Number in household including Respondent:  
99 DON'T KNOW  
99 REFUSED

9. How many of these people are under 18 years of age?

98 Number under 18 yrs. old  
99 DON'T KNOW  
99 REFUSED

10. How about you. Please tell me your age at your last birthday. RECORD IN HOUSEHOLD GRID IN "AGE" COLUMN. CIRCLE APPROPRIATE SEX.

IF MORE THAN ONE HOUSEHOLD MEMBER, ASK Q.11, OTHERWISE SKIP TO Q.12.

11. Starting with the oldest member of this household, please tell me the sex and age of the other household members, and their relationship to you. RECORD IN HOUSEHOLD GRID.

INTERVIEWER CHECK: MAKE CERTAIN THAT THE NUMBER OF RESPONDENTS LISTED IN THE GRID IS THE SAME AS THE NUMBER OF HOUSEHOLD MEMBERS IN Q.8.

#### ASK EVERYONE

12. During the past 12 months, that is, since November, 1982, did you (or any member of this household over five years old) boat, fish, swim, wade or water ski in a freshwater river, lake, pond or stream anywhere in the U.S. for recreational purposes? Please keep in mind that this does not include swimming in swimming pools or boating, fishing or swimming in the ocean.

- 1 Yes → GO TO INSTRUCTIONS FOR ACTIVITY GRID  
2 NO  
3 DON'T KNOW → SKIP TO Q.19  
4 REFUSED

#### INSTRUCTIONS FOR ACTIVITY GRID

ASK Q.13 - 15 IN A SERIES FOR EACH HOUSEHOLD MEMBER OVER FIVE YEARS OLD, STARTING WITH THE RESPONDENT. THEN ASK Q.13 - 15 FOR EACH REMAINING MEMBER OVER 5 YEARS OLD.

13. During the past 12 months, did (you/HOUSEHOLD MEMBER) use freshwater lakes, rivers or streams in this state or any other state for recreational boating? By boating, I mean canoeing, kayaking, rafting, motorboating, sailing, windsurfing, and waterskiing.

14. During the past 12 months, did (you/HOUSEHOLD MEMBER) use freshwater lakes, rivers or streams in this state or any other state for recreational fishing?

15. During the past 12 months, did (you/HOUSEHOLD MEMBER) use freshwater lakes, rivers or streams in this state or any other state for recreational swimming?

FOR EACH "YES" IN Q.13 - 15, ASK Q.16 AND Q.17 IN A SERIES STARTING WITH THE RESPONDENT. THEN ASK Q.16 AND Q.17 FOR EACH REMAINING HOUSEHOLD MEMBER OVER 5 YEARS OLD. RECORD NUMBER OF DAYS ON GRID. RECORD "999" FOR "DON'T KNOW", "9999" FOR "REFUSED" AND "000" FOR "NONE". PRICE NUMBER OF DAYS WITH: Your best estimate will do.

16. About how many days did (you/HOUSEHOLD MEMBER) go freshwater (boating/fishing/swimming) in this state?

17. About how many days did (you/HOUSEHOLD MEMBER) go freshwater (boating/fishing/swimming) out-of-state?

## SECTION 9: HOUSEHOLD ACTIVITIES Q10

Q.11		BOATING				FISHING				SWIMMING			
RELATIONSHIP TO RESPONDENT	SEX	AGE	Q.13	Q.14	Q.15	Q.16	Q.17	Q.18	Q.19	Q.20	Q.21	Q.22	
			IN-STATE	OUT-OF-STATE	IN-STATE	OUT-OF-STATE	IN-STATE	OUT-OF-STATE	IN-STATE	OUT-OF-STATE	IN-STATE	OUT-OF-STATE	
RESPONDENT	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	
	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	
	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	
	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	
	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	
	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	
	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	
	1	2	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	1 YES 2 NO 3 DK 4 REF	

IF ANY HOUSEHOLD MEMBER FISHED, ASK Q.18; OTHERWISE SKIP TO Q.19

(ASK Q.18 ABOUT HOUSEHOLD MEMBER WHO FISHED THE MOST DAYS BOTH IN-STATE AND OUT-OF-STATE. IF MORE THAN ONE QUALIFIES, ASK ABOUT OLDEST MEMBER OF HOUSEHOLD.)

18. How important to (you/HOUSEHOLD MEMBER) is freshwater fishing as a recreational activity? Would you say it is . . . ?

- 1 Very important
  - 2 Somewhat important,
  - 3 or Not at all important?
  - 4 DON'T KNOW
  - 5 REFUSED
- DON'T READ

ASK EVERYONE

19. Did you (or any member of your household) swim in a swimming pool or in the ocean in this state during the past 12 months?

- 1 Yes
- 2 No
- 3 DON'T KNOW
- 4 REFUSED

20. During the past 12 months, did you (or any member of this household) take part in recreational activities on the shore of or near any freshwater lakes, river, or streams anywhere in the U.S.? These could be activities like picnicking, camping, bird watching, duck hunting, or living in a vacation cottage?

- 1 Yes
  - 2 No
  - 3 DON'T KNOW
  - 4 REFUSED
- GO TO SECTION C, PAGE 7

IF "YES" TO Q.20, ASK:

21. Were these activities done in-state, out-of-state, or both?

- 1 In-state
- 2 Out-of-state
- 3 Both
- 4 DON'T KNOW
- 5 REFUSED

## SECTION C: WATER QUALITY LEVELS

This next series of questions is about different levels of water quality in the nation's lakes, rivers, and streams and about how much different levels of water quality in those freshwater bodies is worth to you (and all other members of this household).

In these questions, I will not be talking about saltwater, or water that is underground, or about drinking water, for the remainder of the interview, I will always be referring to the freshwater in lakes, rivers and streams across the country.

Because of growing water pollution problems nationwide, Congress passed strict water pollution control laws in 1972 and 1977 and provided money to pay most of the costs for building new sewage plants for communities. These laws also required many industries to install and pay for expensive water pollution control equipment.

The laws Congress passes are intended to improve the quality of water. One way or thinking about different levels of water quality is to use a ladder like the one shown on Card 3 of the booklet.

The top of the water quality ladder stands for the best possible quality of water, and the bottom of the ladder stands for the worst. On the ladder you can see the different levels of water quality. For example:

Level "D" (POINT) is so polluted that it has oil, raw sewage and other things like trash in it; It has no plant or animal life, smells bad, and contact with it is dangerous to human health.

Water at level "C" (POINT) is boatable. Water of this quality would not harm you if you happened to fall into it for a short time while boating or sailing.

In the United States today, because of water pollution control programs, this is now the minimum national quality level. In other words, the present quality of more than 99 percent of all the nation's freshwater lakes, rivers and streams is at least at this level. Those water bodies which can only be used for boating at the present time are mostly located in areas with a lot of industry and also where large numbers of people live. If we stopped spending money for water pollution control, the quality of these and many other water bodies would fall below the boatable level.

Level "D" (POINT) is fishable. Although some kinds of fish can live in boatable water, it is only when water gets this clean that game fish like bass can live in it. Today many of the nation's freshwater bodies are as clean as this.

Level "A" (POINT) is swimmable. Today perhaps 70 - 80% of the nation's (freshwater is as clean as this.

22. Perhaps as I have talked, you have thought about the quality of water in this area. Think about the nearest freshwater lake, river, stream, pond or creek that is large enough so that game fish might live in it. It does not matter if it is manmade or not, how would you rate its quality of water? Choose a letter on the water quality ladder which you think best describes the water quality of this lake or pond.  
(PROBE: Your best estimate will do.)

<u>LETTER ON LADDER</u>	<u>CORRESPONDING NUMBER ON LADDER</u>
1 D	(0 - less than 2)
2 C	(2 - less than 3)
3 B	(3 - less than 6)
4 A	(6 - less than 8)
5 More than A	(8 - 10)
6 DON'T KNOW	
7 REFUSED	

23. How I'd like you to think about how much having clean water in the United States, including this state, is worth to you and (all members of your household). Some people believe that controlling water pollution is of great value, while other people do not feel that control of water pollution is very important to them. Card 4 in your booklet shows various reasons why some people might value water quality. Please read it over.

Which two of these reasons, if any, for reducing water pollution are most important to you personally? Just read me the numbers.

- 1 Your (Your household's) use of freshwater for fishing, boating or swimming
- 2 Your (Your household's) use of areas surrounding freshwater for picnicking, bird watching, or staying in a vacation cottage
- 3 You (Your household) get satisfaction from knowing other people may use and enjoy freshwater
- 4 You (Your household) get satisfaction from knowing that the nation's water is cleaner
- 5 NONE/IDONOTVALUEWATERQUALITY
- 6 DON'T KNOW
- 7 REFUSED

## SECTION D: WATER QUALITY EVALUATION

In this next section of the questionnaire, I am going to ask you how much it is worth to you in real dollars and cents to reach three different national water quality goals. Since this is not something we usually think about, It may be helpful for you to know what the average household like yours pays in taxes and higher prices for some other types of public programs. In order to do this, would you please look at the next card, Card 5, in the booklet and give me the letter next to the category which includes your (household's) total, yearly gross income from all sources, that is, before taxes in 1982. Once again, I'd like to remind you that this interview is completely confidential and your name will never be associated with your answers. (CIRCLE LETTER OF PAYMENT CARD CHOSEN.)

COLOR OF PAYMENT CARD	
1 A Under \$10,000	WHITE
2 B \$10,000 - \$19,999	YELLOW
3 C \$20,000 - \$29,999	BLUE
4 D \$30,000 - \$49,999	GREEN
5 E \$50,000 or more	PINK
6 F REFUSED	

▶ GIVE RESPONDENT BLUE PAYMENT CARD, AND SAY:  
If you would look at this payment card which  
reflect the middle range of incomes in the  
United States.

GIVE RESPONDENT APPROPRIATE PAYMENT CARD FOR HIS/HER INCOME RANGE.

The payment card I have given you lists many different amounts. It also gives an estimate of how much households in your Income range paid in 1982 in taxes and product prices for programs like the space program, police and fire protection, roads and highways, public education, and the defense program.

As you may also know, programs to control air and water pollution are also something we all pay for. We pay for water pollution control in two ways, as shown on the next card, Card 6.

First, part of the money we pay in federal and state taxes goes to construct sewage treatment plants, conduct research on water pollution and to enforce the water pollution laws. Any local taxes and sewer fees which are often part of your water bill help to pay the cost of running these plants.

The second way involves the price of things we buy. A small amount of the money you pay for many products goes for the water pollution control equipment the government requires industries to install. In order to pay for this equipment, companies increase somewhat the cost of the products they sell to consumers.

GIVE RESPONDENT WORKSHEET AND PENCIL. RESPONDENT SHOULD ALSO HAVE COLORED PAYMENT CARD. REFER TO WORKSHEET AS YOU READ.

Here are (POINTING TO THE LEVELS ON THE WORKSHEET) three national water pollution goals. The lowest one is goal C which is where we are today with 99 percent or more of all freshwater bodies at least at the boatable quality level, although many are higher in quality.

Goal B would be to raise the minimum level to where 99 percent or more of the freshwater bodies would at least be at the fishable level so game fish like bass could live in them.

Goal A would further raise the minimum level to where 99 percent or more of the freshwater bodies would be swimmable.

I'm going to ask you to say how much (you are/your household is) willing to pay each year, if anything, to reach each of these three goals. In doing this, I want you to keep in mind:

- First, imagine that if the amount you are willing to pay is more than you are currently paying in taxes and higher prices for this purpose, your taxes would be raised to cover the cost. Of course, if the amount you are willing to pay is lower, you would receive a refund. In this way, every household in the country, including yours, has the opportunity to say how much they are willing to pay for water pollution control.
- Second, no matter what amount you give for water pollution control, you will also continue to pay for the nation's other environmental programs such as pollution, and that air quality will remain at its present level or improve slightly.

Do you have any questions?

(If RESPONDENT ASKS HOW MUCH HE OR SHE IS CURRENTLY PAYING): I can't give you that information at this point in the interview, because we need to know how much water pollution control is really worth to you without any reference to what you are currently paying for it. However, in order to help you understand how much you are already paying for things the government provides, the payment card gives information about how much you are paying for other types of government programs. At the end of the interview, I will be glad to give you information about your actual payments for water pollution control.

- 24 First, Goal C. What amount on the payment card, or any amount in between is the most you (your household) would be willing to pay in taxes and higher prices each year to continue to keep the nation's freshwater bodies from falling below the boatable level where they are now? In other words, what is the highest amount you (your household) would be willing to pay for Goal C each year before you would feel you are spending more than its really worth to you (all members of your household)?

ENTER DOLLAR AMOUNT HERE, ON FLAP AND ON WORKSHEET

000 ZERO OR "NOTHING"  
998 DON'T KNOW  
999 REFUSED

- 25 Would it be worth anything (more) to you (your household) to achieve goal B, where 99 percent or more of the freshwater bodies are clean enough so game fish like bass can live in them?

1 Yes ----- ▶ SKIP TO Q.26. PAGE 14

2 No  
3 DON'T KNOW  
4 REFUSED } ----- ▶ SEE Q.24; IF DOLLAR AMOUNT GIVEN ON Q.24 THEN  
SKIP TO Q.27. IF "ZERO", "NOTHING" GIVEN ON Q.24  
AND "NO" ON Q.25 THEN SKIP TO Y1; All OTHERS  
SKIP TO Y3.

IF "ZERO", "NOTHING" TO Q.24 [AND] "NO" TO Q.25, ASK Q.Y1

Y1. People have different reasons for saying zero dollars or nothing. For some people that is all water pollution control is worth to them. They don't want to continue to pay anything for it as they are now in taxes and prices. Other people give different reasons for saying this. Did you say zero dollars because that is what water quality is worth to you (your household) or because of other reasons?

- 1 That is what it is worth to me (my household) → SKIP TO Q.37, PAGE 18
- 2 Did not realize I am currently paying for it. I thought that the money I gave would be in addition to what I am paying now
- 3 Some other reason (Specify): → SKIP TO Q.Y3a
- 4 DON'T KNOW → SKIP TO Q.37, PAGE 18
- 5 REFUSED → SKIP TO Q.37, PAGE 18

If "2" ON Q.Y1 ASK:

Y2. You already paying some amount for water pollution control in your taxes and prices. It is very important to us to learn what value you place on achieving the water quality goals when you are given the chance to make the choice yourself. Would you be willing to answer these questions if I later tell you how much you are currently paying in taxes and prices and give you the chance to make any changes in your answers you would like to make?

- 1 Yes → GO BACK TO Q.24
- 2 No
- 3 DON'T KNOW → SKIP TO Q.37, PAGE 18
- 4 REFUSED

IF "DON'T KNOW" OR "REFUSED" TO Q.24, [AND] "DON'T KNOW", OR "REFUSED" TO Q.25, ASK Q.Y3

Y3. People have different reasons for saying they don't know or can't answer these questions. I'm going to read you some reasons. Please tell me whether or not they represent your feelings about this question.

Y3a. Did you give this answer because you are (your household is) paying too much in taxes already and don't want to spend more?

- 1 Yes → SKIP TO Q.Y4
- 2 No
- 3 DON'T KNOW → SKIP TO Q.Y5
- 4 REFUSED

IF "YES" ON Q.Y3a, ASK:

Y4. I'd like to remind you that you are (your household is) already paying some amount for water pollution control in your taxes and prices. It is very important to us to learn what value you place on achieving the water quality goals when you are given the chance to make the choice yourself. Would you be willing to answer these questions if I later tell you how much you are (your household is) currently paying in taxes and prices and give you the chance to make any changes in your answers you would like to make?

- 1 Yes → GO BACK TO Q.24
- 2 No
- 3 DON'T KNOW → SKIP TO Q.37, PAGE 18
- 4 REFUSED

IF "NO", "DON'T KNOW" OR "REFUSED" ON Q.Y3a, ASK:

Y5. Did you give this answer because you think the government should be able to meet this goal with the money they have or because you think the government wastes too much money? (CIRCLE ALL THAT APPLY.)

- 1 Yes, government should be able to meet goal with the money they have
- 2 Yes, government wastes too much money
- 3 No
- 4 DON'T KNOW → SKIP TO Q.Y7
- 5 REFUSED

If "YES" 1 OR 2 ON Q.Y5, ASK:

Y6. It is very important to us to learn what value you (your household) place on achieving the water quality goals when you are given the chance to make the choice yourself. This value is the highest amount you are (your household is) willing to pay for an efficient and worthwhile program to reach each of the water quality goals. Would you be willing to answer these questions if I noted here that the amounts you give are based on the assumption that the water pollution programs would be efficient and well run?

- 1 Yes → GO BACK TO Q.24
- 2 No
- 3 DON'T KNOW → SKIP TO Q.37
- 4 REFUSED

IF "NO", "DON'T KNOW", "REFUSED" ON Q.Y5, ASK:

Y7. Did you give this answer because it is too hard to say without knowing what I am (my household is) is paying now for water pollution control?

- 1 Yes
- 2 No
- 3 DON'T KNOW → SKIP TO Q.Y9
- 4 REFUSED

IF "YES" ON Q.Y7 ASK:

Y8. It is very important to us to learn what value you (your household) place on the water quality goals without being influenced by what you are (your household is) already paying for them. However, would you be willing to answer these questions if I later tell you how much you are currently paying in taxes and prices and give you the chance to make any changes in your answers you would like to make?

- 1 Yes → GO BACK TO Q.24
- 2 No
- 3 DON'T KNOW → SKIP TO Q.37, PAGE 18
- 4 REFUSED

IF "NO", "DON'T KNOW", "REFUSED" ON Q.Y7, ASK:

Y9. Did you give this answer because industry should pay the costs?

- 1 Yes  
2 No  
3 DON'T KNOW  
4 REFUSED

→ SKIP TO Q.Y11

IF "YES" ON Q.Y9 ASK:

Y10. It is very important to us to learn what value you (your household) and other citizens place on the water quality goals because asking you directly for this information is one of the best ways to measure the benefits of achieving these goals. Would you be willing to answer these questions if I noted here your view that industry should pay its share?

- 1 Yes  
2 No  
3 DON'T KNOW  
4 REFUSED

→ GO BACK TO Q.24

→ SKIP TO Q.37, PAGE 18

IF "NO", "DON'T KNOW", "REFUSED", ON Q.Y9, ASK:

Y11. Is there a reason why you gave this answer (ANSWER TO Q.24 AND Q.25) other than the ones I just read to you?

- 1 Yes  
2 No  
3 DON'T KNOW  
4 REFUSED

→ SKIP TO Q.37, PAGE 18

IF "YES" ON Q.Y11, ASK:

Y12. What is this reason?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SKIP TO Q.37, PAGE 18

IF "YES" TO Q.25, ASK:

26. In addition to [READ AMOUNT IN Q.24], what is the most you (your household) would be willing to pay each year to achieve goal B?

ENTER DOLLAR AMOUNT HERE, ON FLAP AND ON WORKSHEET

- 000 ZERO OR "NOTHING"  
998 DON'T KNOW  
999 REFUSED

27. Lastly, would it be worth anything more to (you/your household) to achieve goal A, where 99 percent or more of the nation's freshwater bodies are clean enough to be swimmable?

- 1 Yes  
2 No  
3 DON'T KNOW  
4 REFUSED

→ ASK Q.29

IF "YES" TO Q.27, ASK:

28. In addition to [READ TOTAL AMOUNT FOR Q's 24 AND 26], what is the most you (your household) would be willing to pay each year to achieve goal A?

ENTER DOLLAR AMOUNT HERE, ON FLAP AND ON WORKSHEET.

- 000 ZERO OR "NOTHING"  
998 DON'T KNOW  
999 REFUSED

INTERVIEWER: IF RESPONDENT VOLUNTEERS AT ANY POINT UP TO NOW HE/SHE WANT TO CHANGE THEIR ANSWER PLEASE GO BACK AND DO SO. JUST MAKE SURE THE ANSWERS ARE CHANGED ON THE QUESTIONNAIRE. THE FLAP AND THE WORKSHEET.

29. ADD UP THE AMOUNTS THE RESPONDENT GAVE FOR Q.24, 26 AND 28 AND ENTER THE AMOUNT ON FLAP AND ON WORKSHEET.

At this point in the interview, I want to review what you have just said and give you the chance to make adjustments and changes. We often find when we ask questions like these that people don't realize that we are going to ask them about three different goals until after we have asked all the questions. Looking at the WORKSHEET you said you were willing to pay \$\_\_\_\_\_ for goal C, \$\_\_\_\_\_ more for goal B and \$\_\_\_\_\_ more for goal A. This gives \$\_\_\_\_\_ total dollars as the maximum annual amount (you/your household) would be willing to pay to reach the nation's water quality goals. If you would like to make any changes, please don't hesitate to do so. We want to get your best judgement about how much each of these goals is worth to your household. There are no right or wrong answers. Would you like to shift any amounts around or raise or lower the total amount?

- 1 Yes, make changes  
2 No  
3 DON'T KNOW  
4 REFUSED

→ HELP RESPONDENT CHANGE AMOUNTS ON QUESTIONNAIRE AND ON WORKSHEET INCLUDING TOTAL. RECORD NEW AMOUNTS ON FLAP UNDER COLUMN HEADED Q.29.

VERSION A

INTERVIEWER NOTE: THE DOLLAR VALUES TO BE INSERTED IN QUESTIONS 30, 31, AND 32 IN THE FINAL DOLLAR VALUES GIVEN BY THE RESPONDENT UP TO THIS POINT. THEREFORE, IF RESPONDENT CHANGED DOLLAR AMOUNTS ON QUESTION 29, USE THOSE FIGURES WHEN ASKING QUESTIONS 30, 31 AND 32.

30. You said that you would be willing to pay (READ TOTAL AMOUNT ON WORKSHEET OF Q.24 AND Q.26) to achieve the goal of a fishable level of water quality and (READ AMOUNT ON WORKSHEET AT Q.28) for a further improvement to swimmable.

Would you still be willing to pay (READ AMOUNT AT Q.28). If the best we could do was to raise the amount only halfway from fishable to swimmable? (POINT TO MIDWAY BETWEEN LEVELS B AND A ON WORKSHEET.) At halfway, more water bodies would be improved over the fishable level, and some additional, but not all, water bodies would even be improved to the swimmable level.

- 1 Yes → GO TO Q.32  
2 No  
3 DON'T KNOW → GO TO Q.32  
4 REFUSED

IF "NO" TO Q.30, ASK:

31. In addition to (READ TOTAL AMOUNTS IN Q.24 AND Q.26), what is the most you (your household) would be willing to pay each year to raise the minimum halfway from fishable to swimmable?

ENTER DOLLAR AMOUNT  
000 Zero or "Nothing"  
998 DON'T KNOW  
999 REFUSED

IF ANY DOLLAR AMOUNTS IN Q.24, 26, OR 28, ASK:

32. You said that you (your household) would be willing to pay a total of (TOTAL AMOUNT FOR Q.24, 26, 28) to reach the nation's water quality goals. Presuming that people in other states would also divide their money honestly, how many dollars or what percent of this amount would you give to (THIS STATE) and how many dollars or what percent to the rest of the nation for water improvement?

			DON'T KNOW	REFUSED
THIS STATE	\$ _____	% _____	9998	9999
REST OF NATION	\$ _____	% _____	9998	9999

VERSION A

please look at the water quality ladder again (Card 3). A major purpose of this survey is to learn the value people place on reaching the three national water pollution goals. Because so many people find it hard to say just how much these goals are worth to them in dollars, they sometimes ask us to tell them how much they are currently paying for water pollution control. We don't provide this information early in the interview because we want people to think about how much the goals are really worth to them without being influenced by information such as this.

Now that you have had a chance to think about this, we would like to tell you the dollar range paid for water pollution control by households in your income bracket and offer you the chance to revise your dollar amounts for water pollution. If you should wish to do so for any reason.

Before doing this you need to know two things. First, the actual amount people pay varies according to the size of their household and other factors.

Second, It is uncertain whether paying this amount of money each year will provide enough money to reach any of the goals higher than boatable.

GIVE RESPONDENT APPROPRIATE CARD A9 FOR HIS/HER INCOME. Last year, households like yours paid between (READ RANGE FROM BELOW FOR RESPONDENT'S INCOME GROUP) for the nation's water pollution control programs.

INCOMEGROUP	COLOR CARD	WATER POLLUTION AMOUNT
UNDER \$10,000	WHITE	\$10 to \$100
\$10,000 - \$19,999	YELLOW	\$10 to \$150
\$20,000 - \$29,999	BLUE	\$175 to \$300
\$30,000 - \$49,999	GREEN	\$400 to \$600
\$50,000 OR MORE	PINK	\$1,200 to \$1,500

POINT TO WORKSHEET.

33. Here are the amounts you said you would be willing to pay for the three goals. Please feel free to change any of these amounts, up or down. Remember, what we want is your realistic estimate of the highest amount of money each of these goals is worth to you whether or not you are currently paying that amount. Would you like to make any changes? (PAUSE; IF RESPONDENT APPEARS HESITANT, ENCOURAGE RESPONDENT BY REPEATING RELEVANT PARTS OF THE QUESTION.)

- 1 Yes  
2 No  
3 DON'T KNOW → SKIP TO Q.35  
4 REFUSED

IF "YES" ON Q.33, ASK:

34. What are the new amounts? (HELP RESPONDENT CHANGE THE AMOUNTS ON THE WORKSHEET INCLUDING TOTAL. RECORD THE NEW AMOUNTS ON FLAP.)



## ASK EVERYONE:

35. One last question about the amounts you gave on the worksheet. What if the amounts you gave here were not enough to reach any of these three goals. Including goal C, the boatable level where we are now. Would you (your household) be willing to pay anything more to try to reach any or all of these goals or are these amounts the most you (your household) would realistically give to reach each of them? (PAUSE, IF RESPONDENT APPEARS HESITANT ENCOURAGE RESPONDENT BY REPEATING RELEVANT PARTS OF THE QUESTION.)

- 1 Yes, willing to pay more
  - 2 No, not willing to pay more
  - 3 DON'T KNOW
  - 4 REFUSED
- SKIP TO Q. 37

IF "YES" ON Q. 35, ASK:

36. What is the most you (your household) would pay each year to reach each of goals C, D, and A before you feel you are spending more than it's really worth to you (all members of your household)? (HELP RESPONDENT CHANGE THE AMOUNTS ON THE WORKSHEET INCLUDING TOTAL. RECORD THE NEW AMOUNTS ON FIAP.)

## SECTION E: BACKGROUND INFORMATION

This last section asks a few questions about you.

37. What was the last grade of regular school that you completed? Do not include specialized schools like secretarial, art, or trade schools.

- 1 Grade school or less (0-8)
- 2 Some high school (9-11)
- 3 High school graduate (12)
- 4 Some college or junior college
- 5 College graduate (4 or 5 year degree)
- 6 Post graduate work or degree
- 7 DON'T KNOW
- 8 REFUSED

38. How many years have you lived in THIS STATE? (PROBE: Your best estimate will do. IF LESS THAN 1, ENTER 1.)

Number of Years

- 98 DON'T KNOW
- 99 REFUSED

39. ASK ONLY IF NOT OBVIOUS: How would you describe your racial or ethnic background? READ CHOICES.

- 1 White
- 2 Black
- 3 Hispanic
- 4 Asian or Pacific Islander
- 5 Or some other race (SPECIFY)
- 6 DON'T KNOW
- 7 REFUSED

INTERVIEWER NOTE:

White & Black - Black

White & Hispanic - Hispanic

Black & Hispanic - Hispanic

40. Please turn to the last card in the book -- Card 7. For classification purpose only, please tell me which category best describes the total income that you (and all other members of this household) earned during 1982 before taxes. Please be sure to include each member's wages and salaries, as well as net income from any business, pensions, dividends, interest, tips, or other income. Just tell me the number that best describes your household's income.

- A 1 UNDER \$5,000
- B 2 \$5,000 to less than \$10,000
- C 3 \$10,000 to less than \$15,000
- D 4 \$15,000 to less than \$20,000
- E 5 \$20,000 to less than \$25,000
- F 6 \$25,000 to less than \$30,000
- G 7 \$30,000 to less than \$35,000
- H 8 \$35,000 to less than \$40,000
- I 9 \$40,000 to less than \$45,000
- J 10 \$45,000 to less than \$50,000
- K 11 \$50,000 to less than \$100,000
- L 12 \$100,000 and over
- 13 DON'T KNOW
- 14 REFUSED

IF THIS IS A RESPONDENT - ONLY HOUSEHOLD, SKIP TP Q.42

41. How much of this total household income is income that you personally make? Is your share 75% or less of the total household income or is your share more than 75% of the total household income?
- 1 75% (3/4) or less
  - 2 More than 75%
  - 3 DON'T KNOW
  - 4 REFUSED

ASK EVERYONE:

42. I would like you to think back to the questions I asked you about how much your household is willing to pay to reach each of the three water quality goals, C, B, and A. We find that some peoples are more sure than others about the amounts they gave for Goals C, B, and A. How about yourself? Would you say you are very sure, somewhat sure, somewhat unsure or very unsure about the amounts you gave for these goals?
- 1 Very sure
  - 2 Somewhat sure
  - 3 Somewhat unsure
  - 4 Very unsure
  - 5 DON'T KNOW
  - 6 REFUSED

CLOSING: Thank you for your time and cooperation.

# SECTION F: INTERVIEWER'S EVALUATION

INTERVIEWER: COMPLETE THESE QUESTIONS AS SOON AS POSSIBLE AFTER THE INTERVIEW.

These two questions are only concerned with how the respondent answered Questions 24 - 29, which asked the respondent to value the three levels of water quality.

43. Irrespective of whether or not the respondent answered Q.24 - 29. In your judgement, how well did the respondent understand what he or she was asked to do in these questions?

- 1 Understood completely
- 2 Understood a great deal
- 3 Understood somewhat
- 4 Understood a little
- 5 Did not understand very much
- 6 Did not understand at all
- 7 Other (SPECIFY):

---



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44. Which of the following descriptions best describe the degree of effort the respondent made to arrive at a value for the three levels of water quality?

- 1 Gave the questions prolonged consideration in an effort to arrive at the best possible value
- 2 Gave the questions careful consideration, but the effort was not prolonged
- 3 Gave the questions some consideration
- 4 Gave the questions very little consideration
- 5 Other (SPECIFY):

---



---



---

INTERVIEWER: Hand Respondent  
Filled out "Thank You" pamphlet

STUDY # 65450

65450

Line # \_\_\_\_\_

Location # \_\_\_\_\_

Supervisor's Name: \_\_\_\_\_

Respondent's Name: Mr. Mrs. Miss \_\_\_\_\_  
(Circle)

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code

Telephone #  -  -   
Area Code

Date of Interview: \_\_\_\_\_ Time: \_\_\_\_\_ AM PM  
(Circle)

Length of Interview: \_\_\_\_\_ Minutes

INTERVIEWER: IF RESPONDENT REFUSES TO GIVE YOU HIS/HER TELEPHONE NUMBER, SAY:

"I need your telephone number in order for my supervisor to confirm that  
this interview was conducted properly and that I performed my job in a  
courteous and businesslike fashion. No one else will ever have access  
to your number."

INDICATE: 1 TELEPHONE NUMBER OBTAINED  
2 REFUSED

I hereby certify that this is an honest interview taken in accordance  
with my instructions.

Interviewer's Signature \_\_\_\_\_ Date \_\_\_\_\_

FOR OFFICE USE ONLY

<u>DATE</u>	<u>TIME</u>	<u>RESULT</u>	<u>COMMENTS</u>	<u>VERIFIED BY</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

WATER BENEFITS SURVEY

EXHIBIT BOOKLET

CARD I

STATEMENTS REGARDING POLLUTION CONTROL

- 1- Protecting the environment is so important that pollution control  
requirements and standards cannot be too strict, and continuing  
improvement must be made regardless of cost.

OR

- 2- We have made enough progress on cleaning up the environment that  
we should now concentrate on holding down costs rather than  
requiring stricter controls.

OR

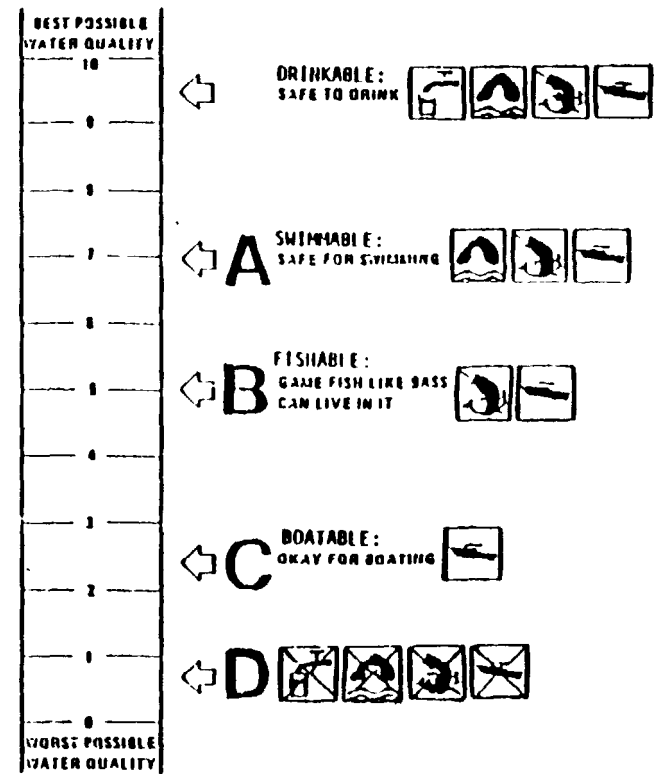
- 3- Pollution control requirements and standards have gone too far,  
and they already cost more than they are worth.

CARD 2  
SOURCES OF WATER POLLUTION

- 1 RUNOFF FROM AGRICULTURE
- 2 SEWAGE FROM CITIES AND TOWNS
- 3 DRAINAGE FROM MINES
- 4 RUNOFF FROM ROADS AND HIGHWAYS
- 5 SEEPAGE FROM GARBAGE DUMPS
- 6 DUMPING OF FACTORY WASTE INTO WATERBODIES

CURRENT MINIMUM LEVEL  
OF NATIONAL WATER  
QUALITY

CARD 3  
WATER QUALITY LADDER



CARD 4

WHY MY HOUSEHOLD MIGHT VALUE NATIONAL FRESHWATER QUALITY

1. I (MY HOUSEHOLD) USE FRESHWATER FOR:  
FISHING  
BOATING, OR  
SWIMMING
2. I (MY HOUSEHOLD) USE AREAS SURROUNDING FRESHWATER FOR:  
PICNICKING  
BIRDWATCHING, OR  
STAYING IN A VACATION COTTAGE
3. I (MY HOUSEHOLD) GET SATISFACTION FROM KNOWING OTHER PEOPLE MAY USE AND ENJOY FRESHWATER
4. I (MY HOUSEHOLD) GET SATISFACTION FROM KNOWING THAT THE NATION'S WATER IS CLEANER

CARD 5

1982 HOUSEHOLD INCOME BEFORE TAXES

- |   |                     |
|---|---------------------|
| A | UNDER \$10,000      |
| B | \$10,000 - \$19,999 |
| C | \$20,000 - \$29,999 |
| D | \$30,000 - \$49,999 |
| E | \$50,000 AND OVER   |

CARD 6

**EVERYONE PAYS FOR WATER POLLUTION CONTROL THROUGH:**

1 A PORTION OF YOUR TAXES

LOCAL SEWER/WATER TAXES

STATE

FEDERAL

To build, maintain, and run community sewage plants, conduct research, enforce water pollution laws, etc.

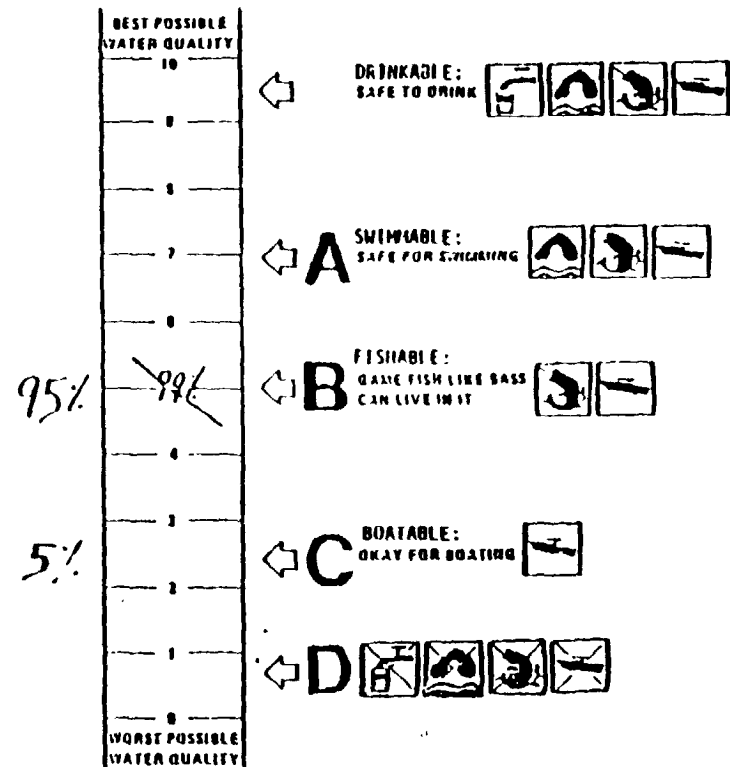
2 A PORTION OF THE PRICES YOU PAY

ON PRODUCTS SOLD TO CONSUMERS BY COMPANIES

To build, maintain, and run waste disposal plants the government requires industries to install in order to meet water pollution standards.

CARD 6A

**WATER QUALITY LADDER**



## CARD 7

1982 HOUSEHOLD INCOME BEFORE TAXES

READ LETTER  
TO INTERVIEWER

UNDER \$5,000 . . . . .	A
\$5,000 - \$9,999 . . . . .	B
\$10,000 - \$14,999 . . . . .	C
\$15,000 - \$19,999 . . . . .	D
\$20,000 - \$24,999 . . . . .	E
\$25,000 - \$29,999 . . . . .	F
\$30,000 - \$34,999 . . . . .	G
\$35,000 - \$39,999 . . . . .	H
\$40,000 - \$44,999 . . . . .	I
\$45,000 - \$49,999 . . . . .	J
\$50,000 - \$99,999 . . . . .	K
\$100,000 AND OVER . . . . .	L

## PAYMENT CARD

ANNUAL HOUSEHOLD INCOME BEFORE TAXES

UNDER \$10,000

(AVERAGE ANNUAL AMOUNT IN 1982 TAXES AND PRICES  
PAID FOR SOME PUBLIC PROGRAMS)

\$ 0	\$ 45	\$120	\$270
1	50	130	280
2	55	140	290
3	60	150	300
4	65	160	320
6	70	170	340
10	75	180	360
15	80	190	380
20	85	200	400—DEFENSE PROGRAM
25	90	220	420
30	95	240—PUBLIC EDUCATION	440
35	100—ROADS AND HIGHWAYS	250	460
40	110	260	480

PAYMENT CARD

ANNUAL HOUSEHOLD INCOME BEFORE TAXES

\$10,000 - \$19,999

(AVERAGE ANNUAL AMOUNT IN 1982 TAXES AND PRICES  
PAID FOR SOME PUBLIC PROGRAMS)

\$ 0	\$ 90	\$295	\$550
5	100 POLICE AND FIRE PROTECTION	310	565
10	110	325	580
15	120	340	595
20	130	355	615
25 --- SPACE PROGRAM	140	370	635
30	150	385	655
35	160	400	675
40	170	415	695
45	180	430	715
50	190 --- ROADS AND HIGHWAYS	445	735
55	205	460	755
60	220	475	775
65	235	490	795
70	250	505 --- PUBLIC EDUCATION	815
75	265	520	835 --- DEFENSE PROGRAM
80	280	535	855

PAYMENT CARD

ANNUAL HOUSEHOLD INCOME BEFORE TAXES

\$20,000 - \$29,999

(AVERAGE ANNUAL AMOUNT IN 1982 TAXES AND PRICES  
PAID FOR SOME PUBLIC PROGRAMS)

\$ 0	\$190	\$ 620	\$1140
10	210 POLICE AND FIRE PROTECTION	650	1180
20	230	680	1220
30	250	710	1260
40	270	740	1300
50	290	770	1340
60 --- SPACE PROGRAM	310	800	1380
70	330	830	1420
80	350	860	1460
90	380 --- ROADS AND HIGHWAYS	890	1500
100	410	920 --- PUBLIC EDUCATION	1540
110	440	950	1580
120	470	980	1620
130	500	1010	1660
140	530	1040	1700
150	560	1070	1740 --- DEFENSE PROGRAM
170	590	1100	1780



PAYMENTCARD

ANNUAL HOUSEHOLD INCOME BEFORE TAXES

\$30,000 - \$49,999

(AVERAGE ANNUAL AMOUNT IN 1982 TAXES AND PRICES  
PAID FOR SOME PUBLIC PROGRAMS)

\$ 0	\$ 450	\$1445	\$2720
15	480 ---POLICE AND FIRE	1520	2805
30	510 PROTECTION	1595	2890
45	540	1670	2975
60	570	1745	3060
90	600	1820	3145
120	--- SPACE PROGRAM	1895	3230
150	695	1970	3315
180	---ROADS AND 770 HIGHWAYS	2045	3400
210	845	2120	3485
240	920	2195	3570
270	995	2210	3655
300	1070	2345	3740
330	1145	2420	3825
360	1220	2495 --- PUBLIC EDUCATION	3910
390	1295	2670	3995
420	1370	2645	4080 ---DEFENSE PROGRAM

PAYMENT CARD

ANNUAL HOUSEHOLD INCOME BEFORE TAXES

\$50,000 AND OVER

(AVERAGE ANNUAL AMOUNT IN 1982 TAXES AND PRICES  
PAID FOR SOME PUBLIC PROGRAMS)

\$ 0	\$1150	\$3860	\$ 7410
25	1250	4060	7660
50	1350 ---POLICE AND FIRE	4260	7910
75	1450 PROTECTION	4460	8160
100	1550	4660	8410
150	1660	4060	8660
200	1760	5060	8910
250	---ROADS AND 1860 HIGHWAYS	5260	9160
300	2060	5460	9410
350	---SPACE PROGRAM	5660	9660
450	2460	6860	9910
650	2660	6060	10160
650	2860	6260	10410
750	3060	6460	10660
850	3260	6660 ---PUBLIC EDUCATION	10910
950	3460	6910	11160 ---DEFENSE PROGRAM
1050	3660	7160	11410

65450

CARD A9

Annual Household Income Before Taxes

Under \$10,000

AMOUNT ACTUALLY PAID IN 1982 FOR WATER QUALITY PROGRAMS

In 1982, households in your income group paid the following amount in local, state and federal taxes and in higher prices for:

All Water Pollution Control Programs Between \$10 and \$100

It is uncertain whether annual payments at this level will be enough to reach the fishable and swimmable water quality goals.

65450

CARD A9

Annual Household Income Before Taxes

\$10,000 - \$19,999

AMOUNT ACTUALLY PAID IN 1982 FOR WATER QUALITY PROGRAMS

In 1982, households in your income group paid the following amount in local, state and federal taxes and in higher prices for:

All Water Pollution Control Programs Between \$70 and \$150

It is uncertain whether annual payments at this level will be enough to reach the fishable and swimmable water quality goals.

CARD A9

CARD A9

Annual Household Income Before Taxes

Annual Household Income Before Taxes

\$20,000 - \$29,999

\$30,000 - \$49,999

AMOUNT ACTUALLY PAID IN 1982 FOR WATER QUALITY PROGRAMS

AMOUNT ACTUALLY PAID IN 1982 FOR WATER QUALITY PROGRAMS

1982, households in your income group paid the following amount in local, state and federal taxes and in higher prices for:

In 1982, households in your income group paid the following amount in local, state and federal taxes and in higher prices for:

All Water Pollution Control Programs      Between \$175 and \$300

All Water Pollution Control Programs      Between \$400 and \$600

It is uncertain whether annual payments at this level will be enough to reach the fishable and swimmable water quality goals.

It is uncertain whether annual payments at this level will be enough to reach the fishable and swimmable water quality goals.

CARD A9

Annual household Income Before Taxes

\$50,000 AND OVER

AMOUNT ACTUALLY PAID IN 1982 FOR WATER QUALITY PROGRAMS

In 1982, households in your income group paid the following amount in local state and federal taxes and in higher prices for:

All Water Pollution Control Programs      Between \$1,200 and \$1,500

It is uncertain whether annual payments at this level will be enough to reach the fishable and swimmable water quality goals.

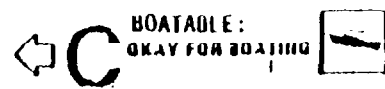
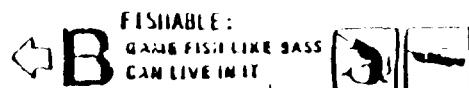
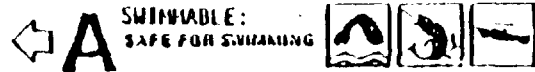
(RESIDENT)  
WORKSHEET

65450

PLEASE KEEP IN MIND

1. EVERY HOUSEHOLD IN THE COUNTRY HAS THE OPPORTUNITY TO SAY HOW MUCH THEY ARE WILLING TO PAY FOR WATER POLLUTION CONTROL.
2. YOU WILL CONTINUE TO PAY WHAT YOU ARE NOW PAYING FOR ALL OTHER ENVIRONMENTAL IMPROVEMENT PROGRAMS, AND THE AMOUNT YOU ARE WILLING TO PAY FOR WATER POLLUTION CONTROL IS IN ADDITION TO THESE OTHER AMOUNTS.

BEST POSSIBLE WATER QUALITY
10
9
8
7
6
5
4
3
2
1
0
WORST POSSIBLE WATER QUALITY



DOLLARS PER YEAR  
IN TAXES AND PRICES

GOAL A

To raise national minimum water quality so that no water bodies are less than swimmable in quality, the most my household is willing to add .....

\$ ..... .00

GOAL B

In order to raise national minimum water quality so that no water bodies are less than fishable in quality, the most my household is willing to add .....

\$ ..... .00

GOAL C

The most my household is willing to add to maintain national minimum water quality so that no lakes, rivers or streams are less than boatable in quality is .....

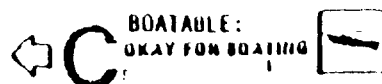
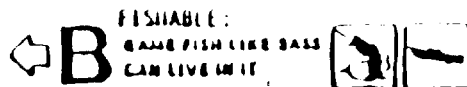
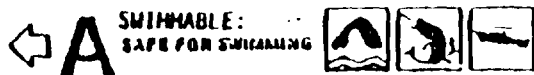
\$ ..... .00

TOTAL AMOUNT TO REACH GOAL ..... \$ ..... .00

PLEASE KEEP IN MIND

1. EVERY HOUSEHOLD IN THE COUNTRY HAS THE OPPORTUNITY TO SAY HOW MUCH THEY ARE WILLING TO PAY FOR WATER POLLUTION CONTROL.
2. YOU WILL CONTINUE TO PAY WHAT YOU ARE NOW PAYING FOR ALL OTHER ENVIRONMENTAL IMPROVEMENT PROGRAMS, AND THE AMOUNT YOU ARE WILLING TO PAY FOR WATER POLLUTION CONTROL IS IN ADDITION TO THESE OTHER AMOUNTS.

BEST POSSIBLE WATER QUALITY
10
9
8
7
6
5
4
3
2
1
0
WORST POSSIBLE WATER QUALITY



DOLLARS PER YEAR  
IN TAXES AND PRICES

GOAL A

To raise national minimum water quality  
so that no water bodies are less than  
swimmable in quality, the most my house-  
hold is willing to add .....

\$ .....00

GOAL B

In order to raise national minimum water  
quality so that no water bodies are less  
than fishable in quality, the most my  
household is willing to add .....

\$ .....00

GOAL C

The most my household is willing to add  
to maintain national minimum water quality  
so that no lakes, rivers or streams are  
less than boatable in quality is .....

\$ .....00

TOTAL AMOUNT TO REACH GOAL .....\$ .....00

## Appendix B

### THE RFF WATER QUALITY LADDER

William J. Vaughan

Water quality can either be described in terms of the uses for which a particular body of water is suitable or in terms of the objective characteristics of the water itself. In turn, objective characteristics traverse a continuum from those that are readily perceptible to those that can only be detected by scientific measurement. In certain dimensions (e.g., visible phenomena such as the extent of algal growth, the clearness of the water, and the existence of suds, foam or debris (David, 1971) people at large find it easy to perceive changes in water quality. However, some characteristics which delineate water quality levels more finely, such as dissolved oxygen content, escape visual and olfactory perception. Thus it is not surprising that people's ratings of water quality levels are likely to exhibit a less-than-perfect degree of association with any one or a combination of the several scientific measures of quality conditions (Binkley and Hanemann, 1978). This poses a problem for benefit estimation because the existence of a positive willingness to pay for water quality improvement depends upon the ability of people to perceive water quality changes when such changes do, in fact, occur.

This problem had lead previous investigators either to attempt to engineer the fortunate marriage of an objective water quality index (based on some weighted combination of scientific quality parameters) and a subjective

index of publicly perceived quality (Bouwes and Schneider, 1979) or to link subjective indices of public perception and expert perception (Dornbusch, 1975).

We choose to describe water quality primarily in terms of the uses for which water becomes suitable, and secondarily in terms of a few obvious water quality conditions (clearness, odor, debris, etc.). However, we located the numerical position of the five posited water quality levels (Boatable, Fishable-2 levels, Swimmable, Drinkable) by indexing a set of five objective scientific water quality parameters using a variant of the National Sanitation Foundation's Water Quality Index (Booth, et. al., 1976; McClelland, 1974) along with informed judgment. In so doing we hope to establish, ex-ante, an admittedly tenuous link between scientifically measured quality characteristics (anchors of the rating scale) and perceived water quality characteristics (the use and readily perceivable objective characteristic descriptors of these anchors).

Specifically, a number of sources were consulted to ascertain the minimally acceptable concentration levels of five measurable quality characteristics associated with five potential uses of natural water courses. These were fecal coliforms (organisms/100 ml), dissolved oxygen (mg/l), maximum BOD-5 (mg/l), turbidity (JTU) and pH.<sup>1</sup>

---

1. Sources consulted include Thomann (1971), U.S.G.S. (1978), Pickle, et. al. (1973), Davis (1968), Economics Research Associates (1979), Katz (1969), Dorfman, et. al. (1972), North Carolina environmental Management Commission. APHA, AWWA and FSIWA (1955), National Technical Advisory Committee (1968). NAS-NAE (1972), EPA (1976), Davidson. Adams and Seneca (1966), National Planning Association (1975).

Table B-1. Consensus Water Quality Characteristics  
of Five Water Quality Classes

Water Quality Classification	Measurable Water Quality Characteristics				
	Fecal Coliforms (#/100 mi)	Dissolved Oxygen <sup>a</sup> (mg/l)	5-day BOD (mg/l)	Turbidity (JTU)	Ph
Acceptable for drinking water treatment 7.25	0	7.0 (90)	0	5	
Acceptable for swimming	200	6.5 (83)	1.5	10	7.25
Acceptable for game fishing	1000	5.0 (64)	3.0	50	7.25
Acceptable for rough fishing	1000	4.0 (51)	3.0	50	7.25
Acceptable for boating	2000	3.5 (45)	4.0	100	4.25

a. Percent saturation at 85° in parentheses.



The five quality measures were the only ones for which numerical values could be obtained across all use classifications, a requirement dictated by the index approach. Particular attention was given to state water quality standards (North Carolina environmental Management Commission, Dorfman, 1972)) because they report specific critical water quality parameters associated with a set (usually four or five) of descriptive water quality classifications. The consensus results for each quality level are summarized in Table B-1. In order to associate each of the five possible sets of scientific measures with a single-valued ordinate or the quality ladder a truncated version of the National Sanitation Foundation Water Quality Index (WQI) was used:

$$WQI = \prod_{i=1}^5 q_i^{\omega_i} / 10$$

where

$q_i$  = the quality of the  $i^{th}$  parameter, a number from 0 to 100 obtained from the transformation functions for water quality measures in McClelland (1974).

$\omega_i$  = the weighted assigned to the  $i^{th}$  parameter. The original weights ( $\omega_i$ ) report in McClelland (1971) cover nine quality measures and  $\sum_{i=1}^9 \omega_i = 1.00$ . Our adjusted weights cover a small number of measures which also sum to 1.0 from:

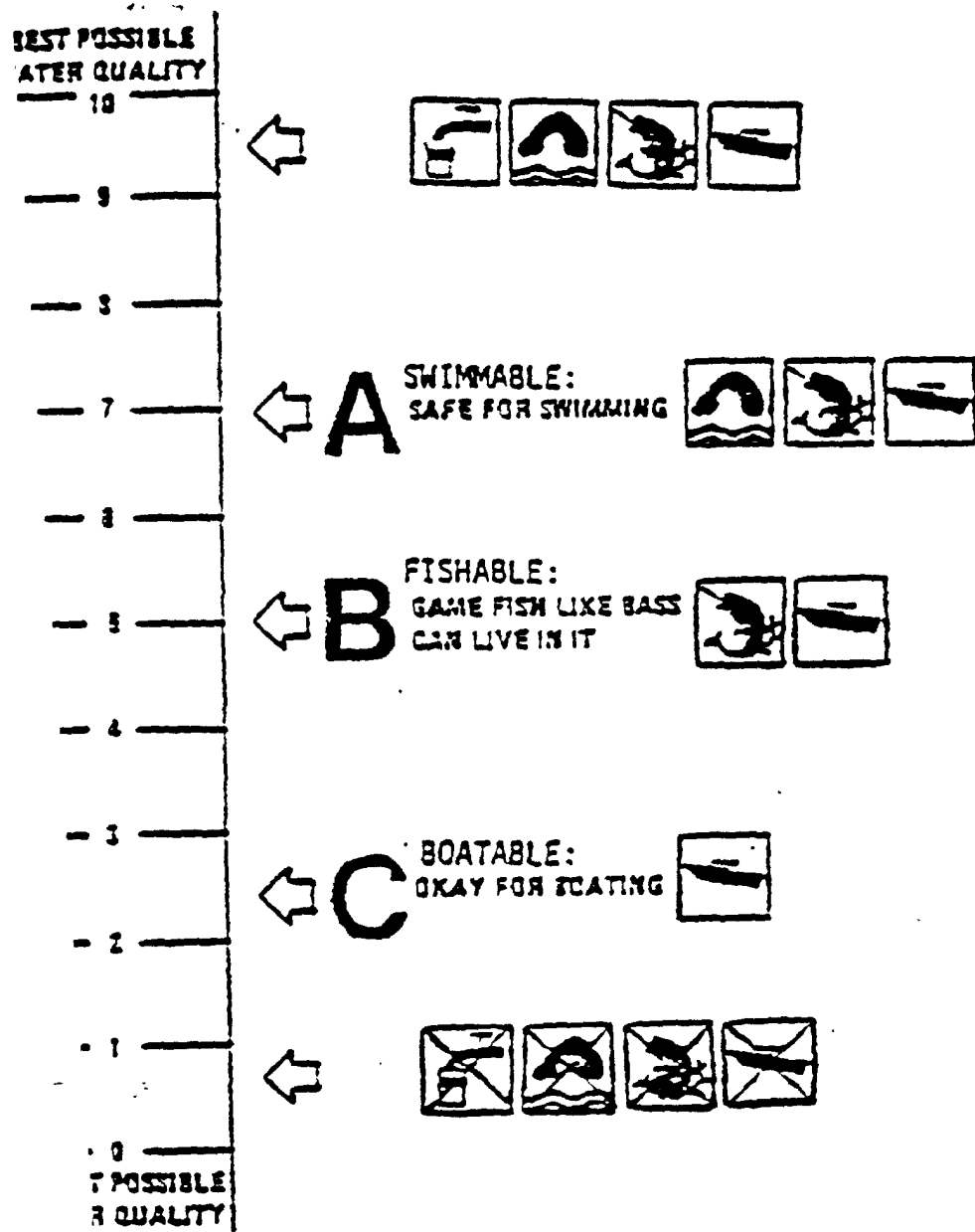
$$\omega_i = \omega_i \left( \frac{\sum_{i=1}^9 \omega_i}{\sum_{i=1}^5 \omega_i} \right)$$

The resultant ladder appears in Figure B-1.

Figure B-1

RESOURCES FOR THE FUTURE

WATER QUALITY LADDER



For example, the index value for the "Acceptable for Fishing" classification was developed as shown below:

<u>Characteristic</u>	<u>Value</u>	<u>Scaled Value</u> ( $q_i$ )	<u>Weight</u> ( $\dot{w}_i$ )	<u>Weighted Scale Value</u> ( $q_i^w$ )
Fecal Coliform	1000/100ml	20	0.242	1.985
Dissolved Oxygen	51% <sup>a</sup>	44	0.274	2.820
Max 5-Day BOD	3 mg/l	74	0.161	2.000
Turbidity	50 JTU	38	0.129	1.599
pH	7.25	93	0.194	2.049

$$\text{Index} = \sum_{i=1}^5 q_i^w / 10$$

- a. Percent saturation at 85°F. Similar calculations for the remaining classes yield the water quality ladder shown in Figure 1.

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